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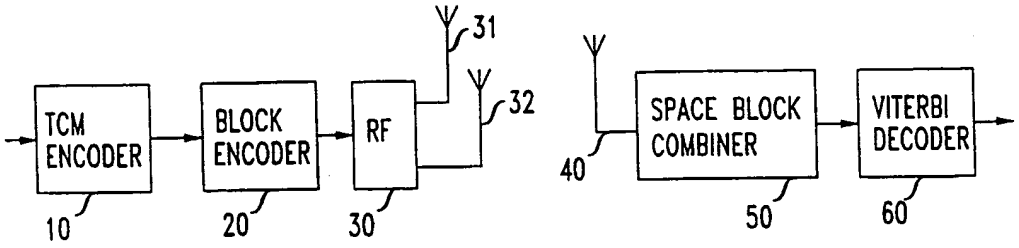
(54) Title: MAXIMUM LIKELIHOOD DETECTION OF CONCATENATED SPACE-TIME CODES FOR WIRELESS APPLICATIONS WITH TRANSMITTER DIVERSITY



(57) Abstract

Good transmission characteristics are achieved in the presence of fading with a transmitter that employs a trellis coder followed by a block coder. Correspondingly, the receiver comprises a Viterbi decoder followed by a block decoder. Advantageously, the block coder and decoder employ time-space diversity coding which, illustratively, employs two transmitter antennas and one receiver antenna.

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INTERNATIONAL SEARCH REPORT

Int. ational Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04B7/06 H04L1/00 H04L25/03 H04L1/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04B H03M H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SESHADRI N ET AL: "SPACE-TIME CODES FOR WIRELESS COMMUNICATION: CODE CONSTRUCTION" 1997 IEEE 47TH. VEHICULAR TECHNOLOGY CONFERENCE, PHOENIX, MAY 4 - 7, 1997, vol. 2, no. CONF. 47, 4 May 1997, pages 637-641, XP000736685 INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, New York, USA. see abstract see page 637, left-hand column, paragraph 3 - paragraph 4 section 2 section 3 section 4 --- -/--	1,2,6,7

[X] Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search	Date of mailing of the international search report
16 April 1999	20/05/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Langinieux, F

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International Application No
PCT/US 98/21959

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SESHADRI N ET AL: "ADVANCED TECHNIQUES FOR MODULATION, ERROR CORRECTION, CHANNEL EQUALIZATION, AND DIVERSITY" AT & T TECHNICAL JOURNAL, vol. 72, no. 4, 1 July 1993, pages 48-63, XP000415859 page 57, section "Diversity using multiple transmit antennas" see page 58, last paragraph ---	1,2,6,7
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P,X	WO 97 41670 A (AT & T CORP) 6 November 1997 cited in the application see abstract see page 3, line 39 - line 32 see page 29, line 5 - line 14 page 26, section N page 29, section P, i page 33, section Q page 34, section S see figures 17,18,21,22 ---	1-13
P,X	TAROKH V ET AL: "Space-time codes for high data rate wireless communication: performance criterion and code construction" IEEE TRANSACTIONS ON INFORMATION THEORY, vol. 44, no. 2, March 1998, pages 744-765, XP002089112 see abstract section G ---	1,2
A	WO 97 24849 A (ERICSSON GE MOBILE INC) 10 July 1997 see abstract see figure 2 see page 1, line 22 - page 2, line 25 see page 5, line 26 - line 28 see page 12, line 18 - page 13, line 1 see page 13, line 14 - line 15 see page 14, line 24 - page 15, line 6 --- -/--	1-13

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INTERNATIONAL SEARCH REPORT

In. ational Application No
PCT/US 98/21959

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	TAROKH V ET AL: "SPACE-TIME CODES FOR HIGH DATA RATE WIRELESS COMMUNICATION: PERFORMANCE CRITERIA" 1997 IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS, MONTREAL, JUNE 8 - 12, 1997, vol. 1, 8 June 1997, pages 299-303, XP000740249 INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS,New York, USA. see abstract ---	1,2,6
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INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. ional Application No
PCT/US 98/21959

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